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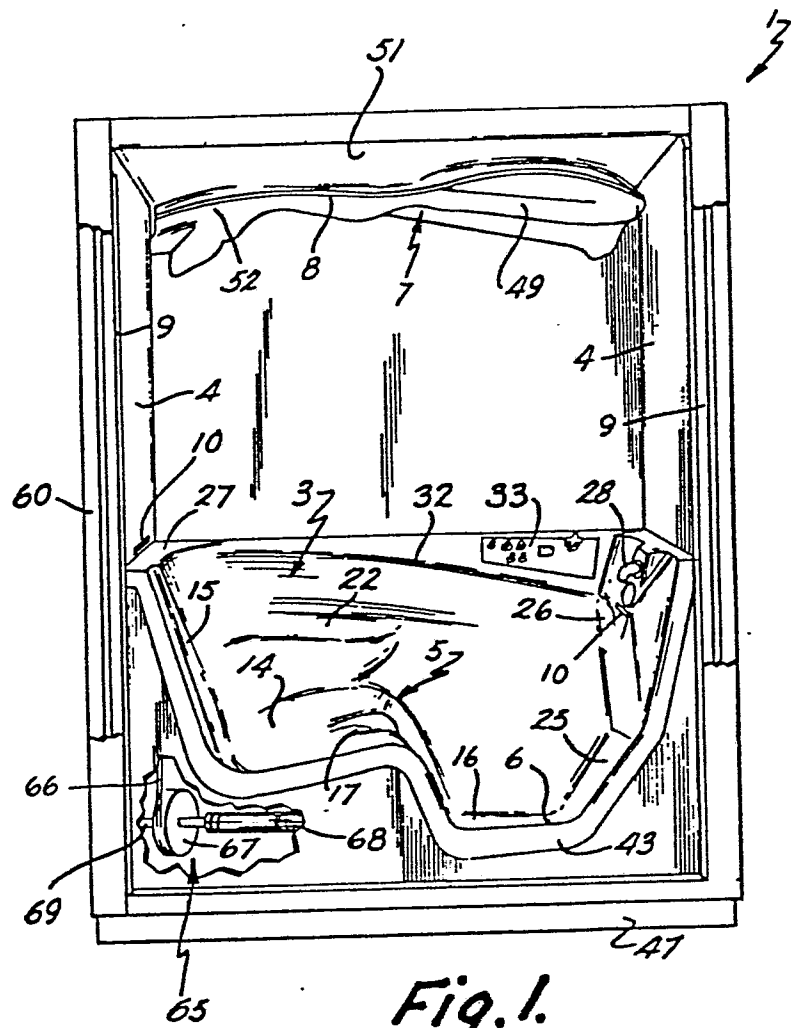
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**Apparatus and method for bathing invalids.**

An arrangement for bathing invalids, or others with impaired ambulatory ability, comprises an enclosure (2) having a bathtub (3) and upstanding walls (4) which form a stall. The bathtub includes a seat (14, 15, 16) having an anatomical contour and a lateral opening adjacent the seat to permit invalid ingress and egress. A door (7) with a generally wedge-shaped contour mates with and selectively closes the bathtub opening, and includes a seal (8) compressed between the lip (6) of the opening and the door to form a seal which is sufficiently leakproof to permit immersal bathing of a seated invalid. The door is slideably mounted on a hingeless track assembly (59), which vertically translates the door into the closed position and pivots the door as it is raised into a horizontal, overhead storage position. Shower heads (10) are mounted on the walls of the stall to provide both shower and immersal bathing for hygiene and therapy. The bathtub seat and opening are mutually orientated so as

to permit an attendant to move the invalid laterally from a wheelchair directly onto the bathtub seat with minimum strain and hazard.

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APPARATUS AND METHOD FOR BATHING INVALIDS

This invention relates to bathing apparatus for bathing invalids and others with impaired ambulatory ability and to methods of bathing invalids.

5. The bathing of invalids in hospitals, nursing homes, convalescent and retirement centres, home care units, and other similar institutions and facilities is a very serious and difficult problem. For example, recent surveys have indicated that there are
10. literally millions of people in the United States with physical impairments which are sufficiently severe to require other than conventional bathing facilities. Quadriplegics, paraplegics, amputees, birth defected, mentally handicapped, stroke victims, arthritics,
15. heavily medicated, aged or terminally ill patients are examples of those who typically require specialized bathing. Regular bathing is essential not only for the hygiene of the patient, but is also used extensively as a treatment, and in conjunction with various types
20. of therapeutic procedures. Because of their physical impairment, many invalids are relegated to sponge baths, and to the indignity of having another person bathe them.

- The use of conventional bathtubs for bathing
25. invalids and other handicapped persons who experience difficulty getting into and out of a normal bathtub is generally considered impractical because of the hazard of injury to the patient and the extensive supervision and assistance required. Attendants find that
30. the physical labour involved in transferring a patient

- from a wheelchair into an ordinary type of bathtub is not only very tiresome and strenuous, but also very dangerous to the patient, as the hazard of slipping or otherwise falling is quite high in tiled, wet bathing areas. Since some infirm patients are unable to step over the edge of a conventional bathtub, or even negotiate the small step at the entrance of a shower enclosure without assistance, attendants must be available at all times, and closely supervise all patient bathing.
- Heretofore, various structures have been devised for bathing invalids, including chair lifts for bathtubs, sliding seat shower stalls, and the like. However, these devices are typically quite expensive to manufacture, require substantial floor space to operate, and do not appreciably alleviate the safety hazards associated with the transference of the patient in and out of the bathing unit. These devices have a complicated construction which is quite difficult to repair and maintain. Also, some of the prior bathing units, particularly those of the chair type, are quite intimidating to the patient, uncomfortable, and often considered somewhat dehumanizing by more sensitive patients.
- Although some prior bathing structures are of a walk-in variety, having a lateral opening and a sealing door, patients cannot be easily transferred directly into these bathing units from a sitting position, such as from a wheelchair or the like. Rather, the patients must be lifted to a standing,

or partially erect position, and then bodily moved into the bathtub. Further, the seals on the closures for such bathing units are quite complex, expensive, and deteriorate quickly.

5. These problems are overcome by the present invention which is described in general terms in the following paragraphs.

10. One aspect of the present invention is a bathtub having a lateral opening in one side of sufficient size to permit invalid ingress and egress there-through. The opening is defined by a lip, and has a generally wedge-shaped contour which opens upwardly. A door selectively closes the opening, and includes a sealing edge with a generally wedge shape which
15. conforms with the contour of the lip. A compression seal is connected with the door sealing edge, and the door is vertically translated between an open position, wherein invalid movement through the opening is permitted, and a closed position, wherein the door
20. and the bathtub converge to compress the seal between the lip and the door edge and form a durable, reliable and uncomplicated seal which permits the bathtub to be filled to a level substantially above the base of the opening for immersal bathing of the invalid.

25. Another aspect of the present invention is a bathing apparatus for invalids, comprising a bathtub with a lateral opening and a sealed door selectively closing the opening. The door is slideably mounted on a pair of tracks disposed on opposite sides of the
30. door, whereby the door is vertically translated

upwardly from the closed position, and rotated into a substantially horizontal, overhead, storage position.

- Yet another aspect of the present invention is a combination shower and bath unit, comprising an
5. enclosure with a bathtub and shower walls upstanding from both ends and a rearward side of the tub to form a stall. The bathtub includes a raised seat portion, a back extending generally upwardly from the seat, and a foot portion positioned below and forwardly of the seat. The seat has an anatomical contour which forms a chair shape for supporting an
10. invalid in a seated position in the bathing unit. The bathtub includes a lateral opening and sealed door arrangement to permit easy access to the unit. At
15. least one shower head is mounted on one of the stall walls, and is orientated toward the seated invalid, whereby the unit is capable of both immersal bathing and showering the invalid for hygiene and therapy. The bathtub seat is preferably disposed at an elevation substantially commensurate with the seat of a
20. conventional wheelchair, so that the invalid may be laterally transferred onto the seat. Also, the entire side of the bathtub is bodily removable so as to fully expose the bathtub seat and thereby facilitate
25. shifting the patient into the bathtub unit from a wheelchair.

- Yet another aspect of the present invention is a method for bathing invalids, comprising removing a lateral door from a bathing unit to fully access an
30. open side, and positioning a wheelchair parallel with

- the bathing unit and beside an exposed seat portion of the tub. The arm of the wheelchair disposed closest to the bathtub is removed, and the attendant grasps the upper body of the invalid and lifts him
5. slightly upwardly to remove his weight from the wheelchair seat, and simultaneously laterally shifts the invalid from the wheelchair onto the bathtub seat by translating the invalid along a slightly arcuate, horizontal path, which permits the attendant to keep
10. his feet fixed in position adjacent the base of the bathtub, and maintain the weight of the invalid close to the attendant's body. When the attendant has set the invalid down, the invalid is seated at an angle to the longitudinal centreline of the bathtub, with
15. his feet hanging over the outer edge of the seat portion, whereby the far side of the bathtub acts as a backrest for supporting and confining the invalid in the seat. The legs of the invalid are then lifted slightly and rotated into the foot portion of the
20. bathtub, thereby simultaneously rotating the torso of the invalid into substantial alignment with the bathtub. The door is then replaced in the bathtub opening, thereby forming a watertight seal therebetween for either shower or immersal bathing of the patient.
25. Thus, according to one or more aspects, the present invention provides a bathing apparatus for invalids, comprising a vertically sliding, wedge shaped door and lateral opening to facilitate access to the bathtub, with a compression seal which is quite
30. durable, relatively uncomplicated and inexpensive, and

- sufficiently effective to remain watertight even when the tub is filled to a level substantially above the base of the opening for immersal bathing of the invalid. The bathtub has a chair-shaped, anatomical contour, with integral armrests, so that the patient can be comfortably bathed by either shower or immersion. The entire side of the bathtub opens to fully expose the seat and back, and thereby facilitate positioning the patient therein. The door is mounted on a counterbalance, overhead, track assembly for accurate positioning of the door, and greatly reducing the floor space required to operate the unit. Shower stall walls extend around the bathtub on three sides thereof, and include a plurality of shower heads mounted thereon, so that the patient can be bathed by either shower or immersion for hygiene and therapy. The shower heads are arranged so that they can be used to warm the tub before the patient is seated therein. An inset is provided in a foot well portion of the bathtub, so that an attendant can easily transfer the patient from a wheelchair onto the tub seat, while maintaining the patient's weight near the attendant's body to reduce strain. A concave notch is located in the door directly above the tub foot well to facilitate cleaning of the patient's feet and legs. A channel is provided in the medial portion of the seat, with a water spray head mounted therein for cleansing the patient's perineal area.
30. The invention may be carried into practice in



various ways but one bathing apparatus embodying the invention will now be described by way of example together with a description of a method of bathing an invalid using the apparatus. The description will be made with reference to the accompanying drawings, in which:

5. Figure 1 is a perspective view of a bathing unit embodying the present invention taken from the front thereof, with a door shown in an overhead storage position, and portions of the unit broken away to reveal the internal construction;

Figure 2 is a front perspective view of the bathing unit, with the door shown in a closed position, and portions of the unit broken away;

15. Figure 3 is a perspective view of the bathing unit taken from the top and slightly forwardly thereof, with the door shown in a closed position, and upstanding sidewalls broken away;

Figure 4 is a vertical cross-sectional view of the bathing unit taken along the line IV-IV, Figure 2;

Figure 5 is a vertical cross-sectional view of the bathing unit taken along the line V-V, Figure 2;

Figure 6 is a lateral cross-sectional view of the compression seal of the bathing unit; and

25. Figure 7 is a fragmentary vertical cross-sectional view of the bathing unit showing the seal compressed in a closed door position.

For purposes of description herein, the terms "upper", "lower", "right", "left", "rear", "front",  
30. "vertical", "horizontal" and derivatives thereof shall

relate to the bathing unit as orientated in Figure 1. However, it is to be understood that the unit may assume various alternative orientations, except where expressly specified to the contrary.

5.           The bathing unit 1 comprises an enclosure 2 with a bathtub 3 and upstanding walls 4 which form a shower stall or cubicle. The bathtub 3 includes a seat 5 having an anatomical contour, and is split vertically adjacent the outer edge to form a lateral opening or face along a lip 6 to permit invalid ingress and egress. A door 7 with a generally wedge-shaped contour mates with and selectively closes the bathtub opening, and includes a compression seal 8 along its bottom edge which is compressed when the door is closed, and forms a seal which is sufficiently leakproof to permit immersal bathing of an invalid disposed on the bathtub seat 5. The door 7 is slideably mounted on a hingeless track assembly 9, which vertically translates the door into the closed position (Figure 2) and pivots the door as it is raised into a horizontal, overhead storage position (Figure 1). Shower heads 10 are mounted on the stall walls 4 to provide both shower and immersal bathing for hygiene and therapy. The bathtub seat 5 and the tub opening are mutually orientated to permit an attendant to move an invalid laterally directly from a wheelchair onto the bathtub seat with minimum strain and hazard.

20.           The bathtub 3 (Figure 1) includes a seat portion 14, a back 15, a foot well 16 and a wall 18 joining the seat portion and the well; it is integrally

moulded in one piece from a durable, rigid, non-corroding material, such as fibreglass. The seat 14 is disposed at an elevation substantially coextensive with that of a conventional wheelchair, and is

5. inclined slightly to the rear. As best illustrated in Figures 3 and 4, a U-shaped trough or channel 17 is disposed in the medial portion of the seat portion 14 and is orientated longitudinally therein. The trough 17 extends from the middle of the seat portion

10. 14 through the wall 18 at the forward edge 19 of the seat portion, and is anatomically shaped and positioned to expose the perineal area of a bather sitting on the seat. A spray nozzle 20 is mounted in one side of the trough 17 with the discharge orifice orientated

15. generally upwardly and can be activated to gently cleanse the perineal area of the invalid's body. The forward edge 19 of the seat portion is rounded, and the rearward edge is arcuately shaped and blends smoothly with the back 15. As best illustrated in

20. Figure 4, the seat 5 includes lateral sidewalls 21 which extend upwardly from the seat 14 and include ledges 22 which form arm rests for the bather. The back 15 (Figure 1) is angled slightly rearwardly, so that the patient is seated in a slightly reclined position

25. in the bathing unit. The foot well 16 is disposed below and forwardly of the seat portion 14, and as best illustrated in Figures 3 to 5, is a shallow reservoir with a drain 23 mounted therein. At the front, the foot well 16 tapers inwardly and it includes a

30. base 24 having a substantially trapezoidal shape as

10.

can be seen in Figure 3. An upwardly inclined kick wall 25 extends from the forward edge of the base 25, and a front panel 26 extends therefrom to the upper edge or rim 27 of the bathtub. The front panel 26

5. (Figure 1) has a bifurcated construction which protrudes forwardly toward the seat and includes a substantially triangular side elevational shape forming the forward portion of a splash guard or rail, described in detail below. A spout 28 (Figure 5)

10. is mounted in a vertical cavity or depression 29 in the front splash guard, and is plumbed to deliver water to the bathing unit. An overflow drain 30 is mounted in the depression 29 directly below the

15. spout 28, and prevents the water level in the tub from rising above the drain. An inwardly protruding rim 32 (Figures 4 and 5) extends around the front and sides of the tub, and forms a splash guard or rail to prevent water from spilling over the sides of the tub, particularly when the unit is used with a hydromassager

20. (not shown). The rim 32 is formed by a pair of inclined ledges or walls 32a, which are integrally joined at a rounded edge. The upper of the walls 32a on the left-hand side of the tub provides a surface on which a control panel 33 is mounted. In this example,

25. the control panel 33 includes three hydraulic toggle valves 34 which individually control the flow of water through the shower heads 10 and the nozzle 20. A main valve 35 controls the flow of water through the spout 28 and shower heads 10, and an automatic

30. mixer 36 controls the temperature of the water emitted

from either the spout or the shower heads. The tub also includes left and right-hand sidewalls 37 and 38 respectively, which extend upwardly from the side edges of the base 24 to the rim 27, blend integrally into the armrest walls 21 and 22, and kick wall 25, and include the associated portion of the splash rail 32.

As best illustrated in Figure 3, the bathtub 3 has a symmetrical top plan shape, and is vertically split, so as to define a stationary half 40 in which the seat 14, back 15 and foot well 16 are located, and a movable half, consisting of the door 7, which is bodily removable from the stationary half 40 to provide access through an opening 41 through which the bather enters and leaves the unit. The parting 42 between the stationary tub half 40 and the door 7 extends through the rim 27 at the forward end of the tub, vertically downwardly through the outer or right hand sidewall 38 at a location slightly outwardly and upwardly from the base 24 and slightly outwardly from the kick wall 25 and front panel 26 such that the foot well 16 is an integrally formed, rather shallow, watertight reservoir. The parting 42 extends from the rearward portion of the foot well 16 vertically upwardly along the intersection of the joining wall 18 and the right hand sidewall 38, and then extends rearwardly along the seat portion 14, slightly inwardly of the intersection of the seat portion 14 and the wall 21 forming the side of the right-hand armrest 22. The parting 42 then extends upwardly

along the back 15 to the rear of the rim 27.

5. The lip 6 extends along the parting 42 and defines the opening 41 through which the bather ambulates to enter the tub. The opening 41 and lip 6 are generally wedge-shaped, as viewed in side elevation, and open upwardly. The term "wedge-shaped" as used herein refers to the mutual orientation of the various portions of the lip 6, wherein opposing sides of the lip are not parallel, but rather
10. diverge in an upward direction. The opening 41 is disposed parallel with the sides of the seat portion 14, so that an invalid can be shifted laterally onto the tub seat from a sitting position. The lip 6 includes a depending flange 44 (Figures 4 and 5)
15. which extends over the upper edge of a side panel 45 disposed on the exterior side of the stationary tub half 40. The location of the parting 42 along the outer side edges of the back and seat provides full, unhindered access to the tub seat 5 to facilitate placing a bather in the unit, as described in
20. greater detail hereinafter.

- As best illustrated in Figure 3, the location of the parting 42 along the base 24 of the foot well 16 forms a lateral inset 43 at that area which is
25. shaped to provide access for the leg of an attendant, so that the attendant can maintain the weight of the invalid close to his body, as well as near the centre of the seat, when an invalid is being shifted between the tub and a wheelchair. Also, the entire bathing
30. unit 1 is raised on a frame 47 to form a toe space 48

- along the front of the unit which allows the attendant to position his feet closer to the centre of the seat portion 14 for reducing the physical strain and safety hazards normally associated with patient transfer. Because the tub has a rather large head of water when full, the drain 23 preferably includes a valve which is hydraulically operated by a remote toggle valve 34a, mounted on the control panel 33. A toggle valve 34b controls a second valve (not shown) which directs the pressurized water from the mixer either to the spout 28 or the shower heads 10. A hand-held shower wand (not shown) may also be provided to facilitate washing the hair of the invalid and other similar uses.
15. The door 7 (Figures 1 and 2) has a substantially planar exterior side 50 and an interior side 51 with a portion of the tub interior moulded integrally therewith to mate with the contour of the stationary tub half 40 when the two halves are converged vertically. The contoured interior surface 49 on the door 7 includes the right-hand armrest or ledge 22 (with respect to a seated bather), the right-hand side 38 of the tub, and the outer portion of the splash rail 32 and tub rim 27. The contoured door surface 49 projects from the door interior 51, and includes a sealing edge 52 along its margin with an outer, marginal ledge, rebate or relief 52a (Figure 7) in which the compression seal 8 is mounted by means such as an adhesive. The sealing edge 52 has an upwardly opening, wedge shape which conforms with the contour

of the lip 6. As best illustrated in Figure 2, the rim 27 along the door 6 includes a notch or indentation 54 disposed directly above the tub foot portion 16 to improve attendant access to the feet and legs of the bather.

5. As shown in Figures 6 and 7, the compression seal 8 has a rectangular cross-section, with ribs or beads 56 extending longitudinally along the lower surface of the strip to facilitate sealing contact with the lip 6. The seal 8 includes a pair of centrally disposed bars or channels 57, and is constructed from a durable, resiliently compressible material such as a closed cell foam-like neoprene. The seal is mounted in the rebate 52a, and is laterally flexible to follow the contour of the sealing edge 52.

10. The track assembly 9 (Figures 1 and 2) to which the door 7 is slideably mounted vertically translates the door into the closed position shown in Figure 2, and pivots the door as it is raised into a horizontal, overhead storage position as shown in Figure 1. Rails 59 (Figure 5) are attached to the sidewalls 4 of the enclosure, and have a generally inverted L-shape (as seen in Figures 4 and 5). The rails comprise front rail sections 60 extending along the forward edge of the stall walls, angled interconnecting sections 61, and horizontal sections 62 which extend rearwardly over the tub along the upper edges of the stall sidewalls. The rail sections 60 to 62 are interconnected by means such as welds to form a rigid



structure having a generally U-shaped transverse cross-sectional shape (Figure 3). Each end of the door 7 includes a pair of rollers 63 respectively mounted at the upper and lower edges thereof by brackets 64.

5. The rollers 63 are positioned inside the associated rails 59, and thereby slideably mount the door on the rails. In the closed position of the door, the track assembly 9 retains the door 7 in a substantially vertical orientation, so that the door converges
10. abuttingly against the lip 6 in a vertical plane. By lifting the door 7, the door is translated on the track assembly in a vertical plane, until the upper rollers 63 engage the inclined track sections 61, at which time further door translation pivots the
15. door into a substantially horizontal orientation directly over the tub, thereby providing an overhead door arrangement which requires minimum floor space for operation. The height of the horizontal rail sections 63 is selected so that the door, when fully
20. open, is disposed well above the heads of the attendant and the bather. A counterbalance mechanism 65 (Figure 1) is attached to the door 7, and assists in raising the door to the overhead position, as well as retaining the door stationary in any selected
25. position. In this example, the counterbalance mechanism 65 comprises a flexible cable 66 attached to the lower edge of door 7, extending in the rails 59, and wound about an axle mounted drum 67 with a torsional coil spring 68 mounted on an axle 69.
30. A lock 70 (Figure 2) is provided positively to

- retain the door 7 in the closed position with the seal 8 compressed firmly between the door edge 52 and the tub lip 6 to form a waterproof seal. In this example, the lock 70 comprises a pair of wedge-
5. shaped bolts 71 mounted in opposite sides of the door 7 which are received in associated plates 72 anchored in the tub sidewalls. To lock the door 7 closed, the bolts 71 are extended outwardly into the plates 72 by means such as an electrically activated solenoid
10. 73, a mechanical foot pedal, or the like. Abutment between the wedge bolts 71 and the plates 72 both forces door 7 downwardly to further compress the seal 8, and positively locks the door in the closed position.
15. The bathing apparatus 1 can be manufactured as either a freestanding unit, or as a structure to be built into a building. The front shower head 10 (Figure 5) is mounted in the recess 29 directly below overflow drain 30, and is fan-shaped to spray water
20. on the invalid from his chest to his feet. The rear shower head 10 (Figure 4) is mounted centrally in rear stall wall 4 above the rim 27, and has a spray pattern designed to impinge upon the neck and the upper back portion of the invalid which projects over the
25. rim 27.
- In the bathing of an invalid, the attendant preferably initially warms the tub by turning on the shower heads 10 with the door 7 in the closed position. After the bathtub walls have been warmed to
30. a comfortable temperature, the attendant turns off

the water, unlocks the door 7, and raises the door to the overhead storage position shown in Figure 1.

The invalid, who is typically seated in a wheelchair, (not shown), or other conveyance, is then positioned

5. alongside the open bathing unit, with the chair wheels in a parallel relationship with the open side of the bathtub and disposed directly beside the seat 14 with the invalid facing forwardly. The arm of the wheelchair disposed closest to the bathtub is then
10. removed or folded down, and the attendant positions himself facing the invalid, placing his right foot in the inset 43, with his toe extending into the toe space 48, and his left foot laterally offset from his right foot a comfortable distance, so as to provide
15. a secure, comfortable stance. The attendant then grasps the upper body of the invalid, and lifting upwardly raises the patient only a distance sufficient to remove his weight from the wheelchair seat, and simultaneously shifts the invalid laterally from the
20. wheelchair onto the bathtub seat portion 5. During this shifting, the invalid is translated along a slightly arcuate, horizontal path which permits the attendant to keep his feet fixed or planted in position adjacent the base of the bathtub, and thereby
25. maintain the weight of the invalid close to his body so as to alleviate strain and hazard. The pivoting motion of the attendant as he shifts the patient from the wheelchair seat onto the bathtub seat is the natural twisting action of this body. When the attendant sets the invalid down, the latter is seated at an
- 30.

- angle to the longitudinal centreline of the bathtub, with his feet hanging over the outer edge of the seat 14. As the attendant sets the patient down into this position, the inner side 37 of the bathtub, along with the left-hand armrest 22, acts as a back-rest, to support and confine the invalid in the bathtub seat. The attendant then lifts the legs of the invalid over the outer edge of the bathtub foot well 16, and rotates his feet into the foot well, thereby automatically and simultaneously rotating the torso of the invalid into a substantially aligned orientation with the longitudinal centreline of the bathtub. The patient is then manoeuvred laterally squarely onto the seat, and the door 7 is pulled downwardly into the closed position and locked securely in place.

15. If the arm of the wheelchair is fixed or otherwise cannot be removed, the attendant must lift the invalid into a partially erect position, a sufficient height from the wheelchair seat that his body will pass over the wheelchair arm. In a manner similar to that described above, the attendant then simultaneously lowers and pivots the patient from this partially erect position onto the bathtub seat.

20. If the invalid is ambulatory, he merely seats himself on the seat 5, in substantially the same position described above when the attendant places non-ambulatory patients on the seat. An attendant will generally be required at least to supervise entry and exit from the bathing unit, as well as to operate door 7.

- After the bathing unit has been sealed closed, the attendant manipulates the mixer 36 to adjust the temperature of the water to the desired level. The drain control 30 is manipulated to close the
5. drain for immersal bathing of the invalid, and is generally kept open for showering the invalid. The control valve 35 is manipulated by the attendant to open the flow of water into the bathtub through the spout 28. The shower heads 10 are individually
10. activated by shifting the toggle switches 34. Bathing of the perineal area is accomplished by manipulation of one of the toggle valves 34. The door notch 54 facilitates access by the attendant to the legs and feet of the bather.
15. After the invalid has been bathed, the attendant empties the bath and then unlocks the door and lifts the same upwardly into the overhead storage position (Figure 1). The patient's feet are swung outwardly from the foot well 16, so that his legs extend over
20. the outer edge of the seat. The patient is then laterally shifted by the attendant back onto the wheelchair seat by reversing the steps employed to place the patient into the bathtub.
- The upwardly orientated wedge-shaped bathtub opening and door employ a relatively uncomplicated
25. inexpensive compression seal which is quite durable, and sufficiently effective to maintain the bathtub watertight, even when water is filled in the tub to a level substantially above the base of the bathtub
30. opening for immersal bathing of the invalid. The

- chair-shaped, anatomical contour of the bathtub allows the invalid to rest comfortably while being bathed, and the entire side of the bathtub opens to fully expose the seat and back and thereby facilitate
5. positioning of the patient in the tub. The door is slideably mounted on a counterbalance, overhead track assembly, thereby greatly reducing the floor space required to operate the unit, and accurately positioning the door in a sealing relationship with
10. the bathtub lip. The shower stall walls with multiple shower head arrangement permit the patient to be bathed by either shower or immersion for hygiene and therapy. The inset and toe space at the foot well of the tub allows the attendant to transfer the bather
15. to and from a wheelchair with a natural pivoting motion, while maintaining the weight of the patient near the attendant's body to reduce strain.

CLAIMS

1. A bathing apparatus for invalids, comprising:  
a bathtub (3) having a lateral opening in a side thereof with sufficient size to permit invalid ingress and egress therethrough; said lateral opening being defined by a lip (6), and having a generally wedge-shaped contour (Figure 1) which opens upwardly;

a door (7) selectively closing the opening, and having a sealing edge (52) with a generally wedge shape which conforms with the contour of said lip;

a compression seal (8) connected with the lip or the door sealing edge;

means (59 - 64) for vertically translating said door between an open position wherein invalid movement through said opening is permitted, and a closed position wherein said door and said bathtub are converged to compress said seal between said lip and said door sealing edge and form a seal therebetween which is leakproof when said bathtub is filled with water to a level substantially above a base portion of said lip for immersal bathing of an invalid; and

means (70 - 73) for selectively locking the door in the closed position.

2. A bathing apparatus as claimed in Claim 1 in which the vertical translating means comprise a pair of inverted, generally L-shaped tracks (59), which are supported on opposite sides of the door and orientated to translate the door vertically into the closed position, and rotate the door as it is

raised from the closed position into a substantially horizontal, overhead storage position directly over the bathtub.

3. A bathing apparatus as claimed in Claim 1 or Claim 2 in which the opening comprises an entire side of the bathtub which extends from a front wall (25, 26) to a rear wall (15) thereof.

4. A bathing apparatus as claimed in Claim 1, Claim 2 or Claim 3 in which the bathtub includes a seat portion (14) disposed at an elevation substantially commensurate with the seat of a conventional wheelchair, a back portion (15) extending generally upwardly from the seat portion, and a foot portion (16) disposed below and forward of the seat portion; the seat, back and foot portions being shaped to support an invalid in a seated position.

5. A bathing apparatus as claimed in any of Claims 1 to 4 which includes a plurality of shower heads (10) mounted about an upper portion of said bathtub.

6. A bathing apparatus as claimed in any of Claims 1 to 5 in which the bathtub lip (6) includes a lateral inset (43) at said base portion shaped to provide access for the leg of an attendant to facilitate shifting the invalid to and from the seat portion (14).



7. A bathing apparatus for invalids, comprising:

a bathtub (3) having a lateral opening in one side thereof with sufficient size to permit invalid ingress and egress therethrough;

a door (7) selectively closing the bathtub opening;  
means (8) for forming a seal between the door and the bathtub when the door is in a closed position which is leakproof when the bathtub is filled with water to a level substantially above a base portion of the opening for immersal bathing of an invalid;

a pair of tracks (59) supported on opposing sides of the door, and extending vertically upwardly above the bathtub and rearwardly thereof over the bathtub;

means (63) for slideably mounting the door on the tracks and vertically translating the door upwardly from the closed position, and rotating the door as it is raised into a substantially horizontal, overhead storage position directly over the bathtub.

8. A bathing apparatus as claimed in Claim 7 which includes means (65 - 69) for counterbalancing the weight of the door, whereby the door will remain stationary in substantially any position in which it is placed.

9. A bathing apparatus as claimed in Claim 8 in which the tracks have a horizontal section (62) in which the door is supported in the storage position; and the horizontal track sections are disposed at an elevation which retains the door above the height of the average invalid and attendant.

10. A bathing apparatus as claimed in Claim 7 or Claim 8 or Claim 9 in which the bathtub includes a lateral inset (43) shaped to provide access for the leg of an attendant to facilitate shifting the invalid to and from said seat portion.

11. A combination shower and bath unit, comprising:

an enclosure (2) including a bathtub (3) with walls (4) upstanding from both ends and a rearward side thereof to form a stall;

the bathtub having a raised seat portion (14), a back portion (15) extending generally upwardly from the seat portion, and a foot portion (16) disposed below and forwardly of the seat portion; the seat, back and foot portions having a contour which forms a chair shape for supporting an invalid in a seated position in the unit;

the bathtub having a lateral opening in one side thereof with sufficient size to permit invalid ingress and egress therethrough, and being orientated substantially parallel with the sides of the seat portion;

a door (7) selectively closing the bathtub opening;

means(8) for forming a seal between the door and the bathtub when the door is in a closed position; and

at least one shower head (10) mounted on one of the stall walls and orientated toward the seated invalid.

12. A combination shower and bath unit as claimed in Claim 11 which includes a plurality of said shower heads (10) mounted about said stall walls for showering the invalid from three sides simultaneously.

13. A combination shower and bath unit as claimed in Claim 11 or Claim 12 in which the seat portion includes a channel (17) centrally disposed at the forward edge thereof for bathing the perineal area.

14. A combination shower and bath unit as claimed in Claim 13 which includes a spray nozzle (20) mounted in the channel and orientated for cleaning the perineal area of the invalid.

15. A combination shower and bath unit as claimed in any of Claims 11 to 14 in which the bathtub includes integrally formed armrests (32), one of which is disposed on the interior surface of the door.

16. A bathing apparatus for invalids, comprising:  
a bathtub (3) having a seat portion (14) disposed at an elevation substantially commensurate with the seat of a conventional wheelchair, a back portion (15) extending generally upwardly from said seat portion, and a foot portion (16) disposed below and forwardly of the seat portion; the seat, back and foot portions having a contour which forms a chair shape for supporting an invalid in a seated position in the bathtub; the bathtub having opposed sides (37, 38) which extend upwardly from the seat and foot portions and form a closed reservoir for partially immersing the seated invalid; one of the bathtub sides (38) being bodily removable from the bathtub to expose an opening defined

by the outer side edge of said seat, back and foot portions, the said one bathtub side forming a door (7) for selectively closing the opening;

means (8) for forming a seal between the door and the bathtub when the door is in a closed position which is leakproof when said bathtub is filled with water to a level substantially above the outer edge of said foot portion for immersal bathing of the invalid; and

means (59 - 64) for removing the door to fully access the opening, whereby when a wheelchair is parked parallel with said bathtub, beside the seat portion thereof, an attendant can laterally shift a patient from the wheelchair onto the bathtub seat portion by translating the patient along a slightly arcuate, substantially horizontal path with a natural, unrestrained motion, which permits the attendant to keep his feet fixed on the floor, and maintain the weight of the invalid close to his body.

17. A bathing apparatus as claimed in Claim 16 in which the bathtub includes a base with a toe space (48) to further facilitate invalid transport.

18. A method for bathing invalids, comprising the steps of:

providing a bathtub (3) having a seat portion (14) disposed at an elevation substantially commensurate with the seat of a conventional wheelchair, a back portion (15) extending generally upwardly from the seat portion, and a foot portion (16) disposed below

and forwardly of the seat portion; the seat, back and foot portions having an anatomical contour which forms a chair shape for supporting a user in a seated position in the bathtub; the bathtub having opposed sides (37, 38) which extend upwardly from said seat and foot portions, and form a closed reservoir for immersal bathing of an invalid in said bathtub; one of the said bathtub sides (38) being bodily removable from the bathtub to expose an opening defined by the outer edge of said seat, back and foot portions, and forming a door (7) selectively closing said opening; the bathtub including means for forming a watertight seal (8) between the door and the bathtub when the door is in a closed position;

removing the door (7) from the bathtub (3) to fully access the said open side;

positioning the wheelchair with an invalid therein parallel with the bathtub and beside the seat portion (14);

removing the wheelchair arm disposed closest to the bathtub;

grasping the upper body of the invalid and lifting upwardly to remove his weight from the wheelchair seat, and simultaneously shifting the invalid laterally from the wheelchair onto the bathtub seat portion by translating the invalid along a slightly arcuate path which permits the attendant to keep his feet fixed in position adjacent the base of the bathtub, and maintain the weight of the invalid close to the attendant's body; the invalid being seated at an angle to the longitudinal centreline of the bathtub with his feet hanging over the outer edge of the seat portion; the bathtub other side (37) acting as a backrest for supporting and confining the invalid in the seat portion;

28.

lifting the legs of the invalid over the outer edge of the bathtub foot portion, and rotating his feet into the foot portion, thereby simultaneously rotating the torso of the invalid into substantial alignment with the longitudinal centreline of the bathtub; and

replacing the door (7) in the bathtub opening, and forming a watertight seal therebetween for bathing the patient.

19. A method as claimed in Claim 18 which includes removing the wheelchair arm disposed closest to the bathtub prior to the grasping of the invalid and in which the said arcuate path is approximately horizontal.

20. A method as claimed in Claim 18 in which the invalid is lifted upwardly over the wheelchair arm disposed closest to the bathtub and in which the arcuate movement includes a downward component.

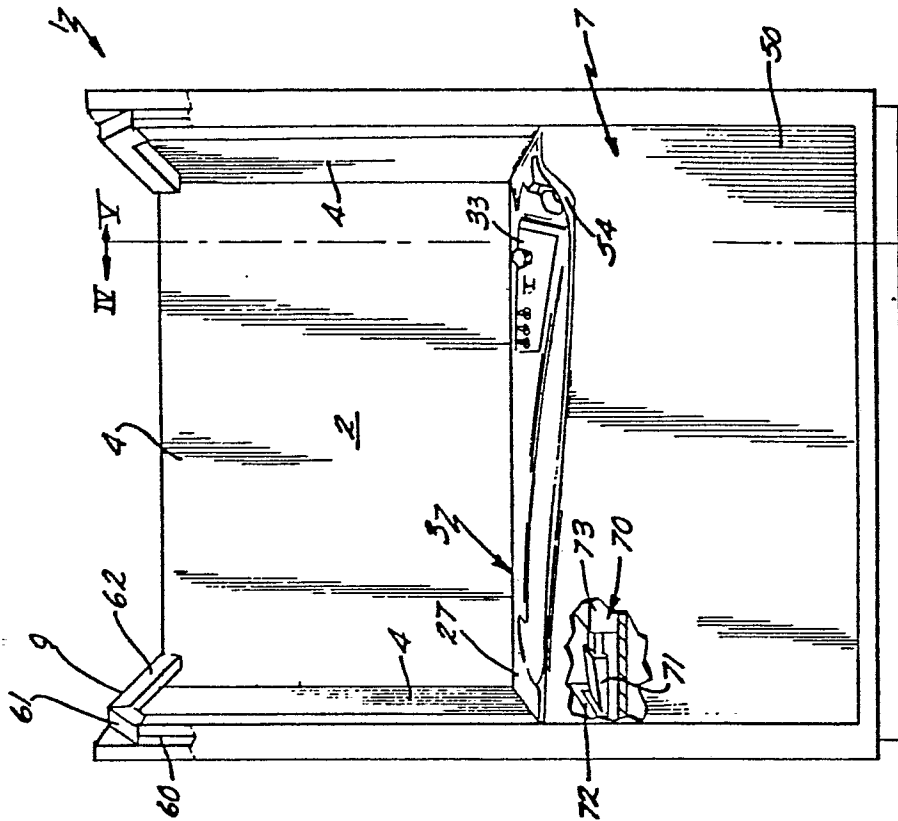


Fig. 2.

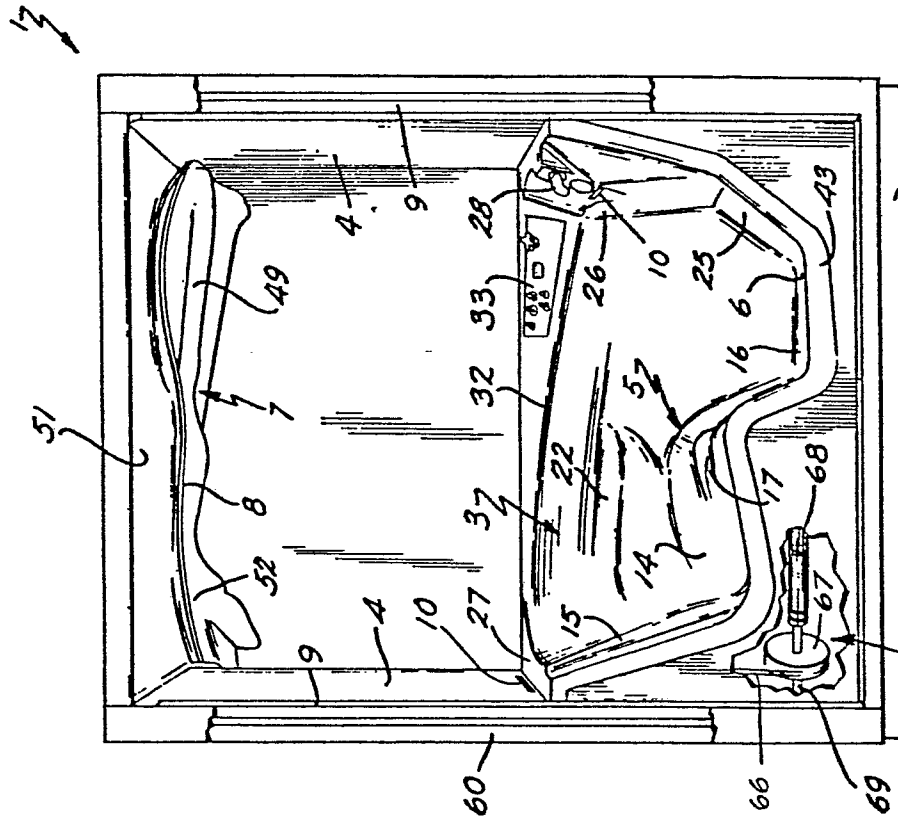


Fig. 1.

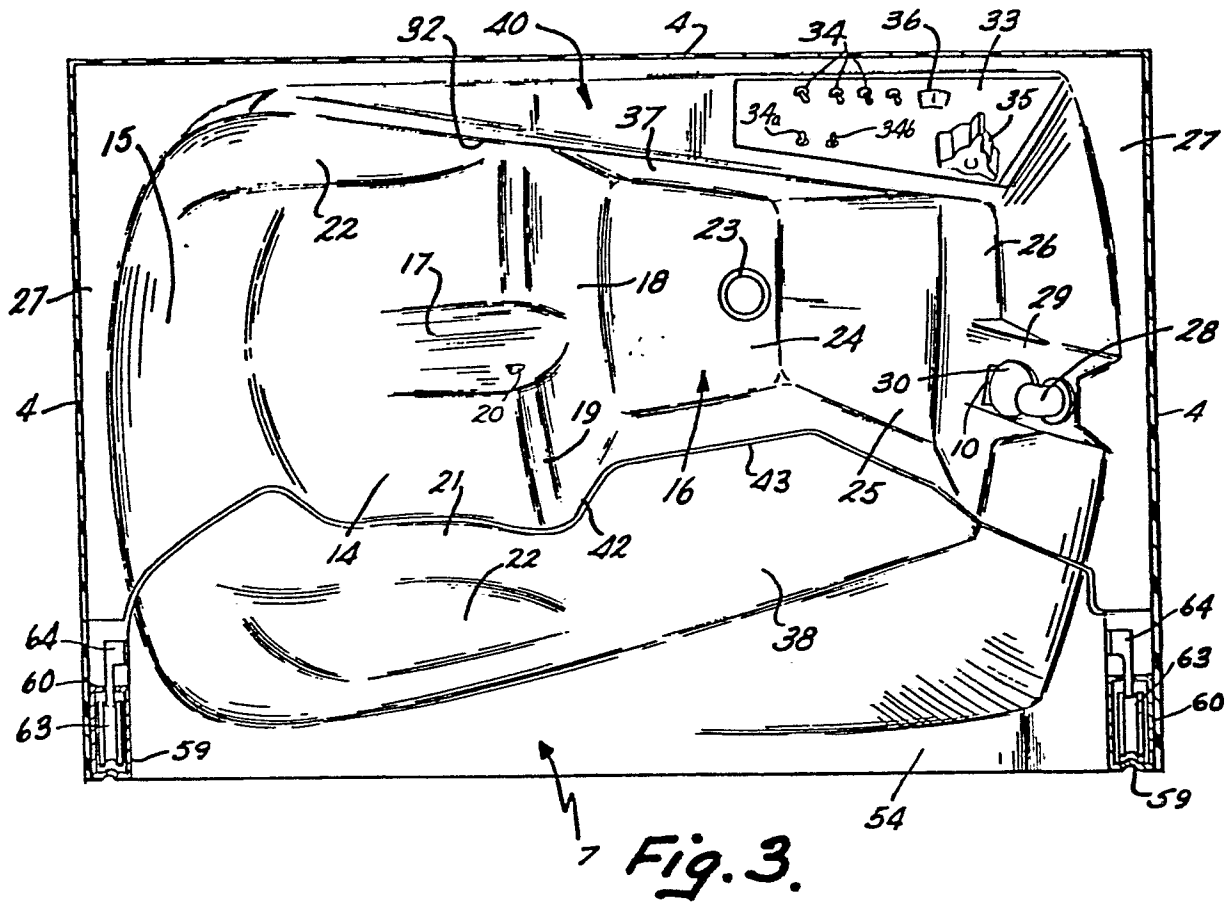


Fig. 3.

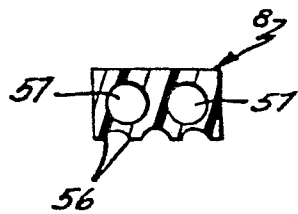


Fig. 6.

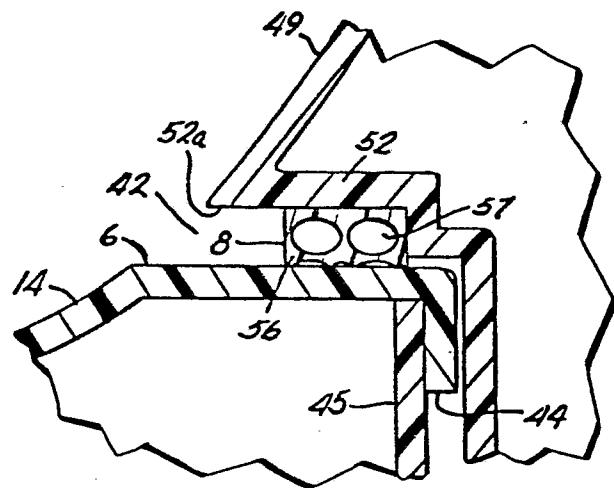


Fig. 7.



